

Notice of Allowability

Application No.

10/008,987

Examiner

Philip B. Tran

Applicant(s)

BUSSER ET AL.

Art Unit

2155

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/17/06.
2. ☒ The allowed claim(s) is/are 1-11 and 13-19.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date Attached.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date Attached.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Philip B. Tran

Philip B. Tran
PRIMARY EXAMINER
AU 2155

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. Authorization for this examiner's amendment was given in a telephone interview with Mr. Knepper (Reg. No. 44,189), the undersigned, on June 09, 2006.

The application has been amended as follows:

IN THE CLAIMS:

Claim 20 has been canceled.

Claims 1, 10 and 15 have been amended.

Amend claim 1 as follows:

1. (Currently Amended) A method for mirroring data using two controllers in a storage system, comprising:

determining that metadata relating to data to be mirrored by a first controller to a second controller can be sent in a small write mirror message;

providing a first message comprising a write mirror message that includes said metadata relating to data to be mirrored by a first controller to a second controller and in which said first message including said metadata is not greater than 128 bits, with said first message being part of a first mirroring operation, wherein said first message is

generated by said first controller, and wherein said first message comprises an initial notification message; and

continuing with said first mirroring operation after said providing a first message by providing a second message comprising a data mirror message that includes user data to said second controller [[.]] , wherein said first message is associated with a first number of interrupts, wherein in response to determining that metadata cannot be sent in a small write mirror message a second message is sent and is associated with a second number of interrupts, and wherein said first number of interrupts is less than said second number of interrupts.

Amend claim 10 as follows:

10. (Currently Amended) A method for mirroring using two controllers in a storage system, comprising:

making a determination related to contents of a first message with a first controller, wherein said first message is to be sent by said first controller to a second controller as part of a first mirroring operation, and wherein said first message is a message providing a first notification to the second controller that data will be mirrored to the second controller; and

producing said first message having contents that depends on said making step, wherein:

1) when said making step determines that data to be sent comprises less than or equal to a predetermined number of bits such that a small write mirror message can

be sent, said first message includes metadata information for user data associated with the first mirroring operation, **wherein said first message is associated with a first number of interrupts**; and

2) when said making step determines that said data is greater than said predetermined number of bits, at least less than all of said metadata associated with said first mirroring operation is not included with said first message, **wherein said first message is associated with a second number of interrupts that is greater than said first number of interrupts**.

Amend claim 15 as follows:

15. (Currently Amended) An apparatus for mirroring data using two controllers in a storage system, comprising:

a first controller that generates one of a first message and a second message depending on an amount of data to be sent by said first controller to a second controller as part of a first mirroring operation, wherein said first message is sent in response to determining that said amount of data to be sent by said first controller is less than or equal to a predetermined number of bytes, wherein said first message comprises **a small write mirror message that includes** metadata related to user data included in said first mirroring operation; and

a second controller that receives said data from said first controller, wherein when said first or second message is sent by said first controller said first or second

message comprises an initial notification message to said second controller related to the first mirroring operation [[.]] ,wherein:

when said first message is generated, said first mirroring operation is associated with a first number of interrupts and, when said second message is sent, said first mirroring operation is associated with a second number of interrupts, with said second number of interrupts being greater than said first number of interrupts.

3. Formal corrected drawings must be submitted including changes required by the examiner to correct figures 1 & 3-4 & 6 that are blurry. In order to avoid abandonment of this application, formal drawings are required in reply to the Office action.

REASONS FOR ALLOWANCE

4. Claims 1-4, 6-7, 9-11 and 13-19 are allowable over the prior art of record.

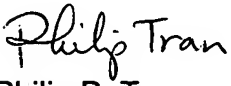
5. This communication warrants no examiner's reason for allowance, as applicant's reply makes evident the reason for allowance, satisfying the record as whole as required by rule 37 CFR 1.104 (e). In this case, the substance of applicant's remarks in the Amendment filed on 27 February 2006 with respect to the amended claim limitations and further amended claim limitations in the Examiner's Amendment filed on 09 June 2006 point out the reason claims are patentable over the prior art of record. Thus, the

reason for allowance is in all probability evident from the record and no statement for examiner's reason for allowance is necessary (see MPEP 13202.14).

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip B. Tran whose telephone number is (571) 272-3991. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Philip B. Tran
Primary Examiner
Art Unit 2155
June 09, 2006